

[Web](#) - [Images](#) - [Groups](#) - [Directory](#) - [News](#) -

Searched the web for +"rhythmic input".

Results 1 - 10 of about 460. Search took 0.12 seconds.

### Exploring Tabla Drumming Using Rhythmic Input

Top Indexes TOC Exploring Tabla Drumming Using **Rhythmic Input**. ... We describe a system that enables the use of **rhythmic input** for exploring Indian tabla drumming. ...

[www.acm.org/sigchi/chi95/proceedings/shortppr/rwx\\_bdy.htm](http://www.acm.org/sigchi/chi95/proceedings/shortppr/rwx_bdy.htm) - 12k - Dec 27, 2003 - [Cached](#) - [Similar pages](#)

### Muscle response to changing neuronal input in the lobster ( ...

... to changing neuronal input in the lobster (*Panulirus interruptus*) stomatogastric system: slow muscle properties can transform **rhythmic input** into tonic output. ...

[www.ncbi.nlm.nih.gov/entrez/query.fcgi?holding=npg&cmd=Retrieve&db=PubMed&list\\_uids=9547250&a...](http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?holding=npg&cmd=Retrieve&db=PubMed&list_uids=9547250&a...) -

[Similar pages](#)

### Record Input Notes (Alt+Space) - Step True Tracking (F5) - in ...

... If you knew that the conductor wanted to take this passage at a tempo of 260 beats per minute, however, you might want to use the "**Rhythmic Input Part**" shown ...

[www.swansos.com/help/supttinrecord.htm](http://www.swansos.com/help/supttinrecord.htm) - 12k - [Cached](#) - [Similar pages](#)

### Quantitative Biology Institute

... We have shown that pyloric muscles have very non-linear responses to changing neural input (including transforming **rhythmic input** into tonic contraction), and ...

[www.biosci.ohiou.edu/qbi/faculty\\_hooper.html](http://www.biosci.ohiou.edu/qbi/faculty_hooper.html) - 10k - [Cached](#) - [Similar pages](#)

### Oscillatory Neurocomputers With Dynamic Connectivity

... However, the **rhythmic input** can force any two oscillators to interact, which we call dynamic connectivity, if the input's Power spectrum includes the ...

[www.nsi.edu/users/izhikevich/publications/patent.htm](http://www.nsi.edu/users/izhikevich/publications/patent.htm) - 4k - [Cached](#) - [Similar pages](#)

### J. Neurosci. -- Abstracts: Morris and Hooper 18 (9): 3433

... to Changing Neuronal Input in the Lobster (*Panulirus Interruptus*) Stomatogastric System: Slow Muscle Properties Can Transform **Rhythmic Input** into Tonic Output. ...

[www.jneurosci.org/cgi/content/abstract/18/9/3433](http://www.jneurosci.org/cgi/content/abstract/18/9/3433) - [Similar pages](#)

### [PDF] Spectral mixing of rhythmic neuronal signals in sensory cortex

File Format: PDF/Adobe Acrobat - [View as HTML](#)

... of neuronal activity in the vibrissa primary sensory cortex of rat, a region that receives intrinsic as well as sensory-driven **rhythmic input** during natural ...

[physics.ucsd.edu/neurophysics/publications/ahrens\\_pnas\\_mixing.pdf](http://physics.ucsd.edu/neurophysics/publications/ahrens_pnas_mixing.pdf) - [Similar pages](#)

### [PDF] A Comparison of Models for Rhythmical Beat Induction

File Format: PDF/Adobe Acrobat - [View as HTML](#)

... 3.1 **Rhythmic input** for the relaxation oscillator The same type of input is used for the relaxation oscillator as is used for the positive evidence model in ...

[crca.ucsd.edu/~afindley/beat\\_induction.pdf](http://crca.ucsd.edu/~afindley/beat_induction.pdf) - [Similar pages](#)

### [PDF] Crossed Rhythmic Synaptic Input to Motoneurons during Selective ...

File Format: PDF/Adobe Acrobat - [View as HTML](#)

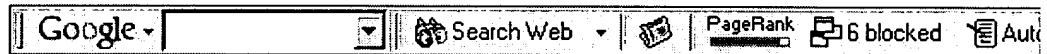
... Page 2. excitatory **rhythmic input** to a smaller population of flexor-related motoneurons. MATERIALS AND METHODS Dissection. One-day-old Wistar rats were used. ...

[www.neuro.ki.se/kiehn/Doc/97.pdf](http://www.neuro.ki.se/kiehn/Doc/97.pdf) - [Similar pages](#)

Neuroscience in the Hooper Lab

... to changing neuronal input in the lobster (*Panulirus interruptus*) stomatogastric system: Slow muscle properties can transform **rhythmic input** into tonic output. ...  
crab-lab.zool.ohiou.edu/hooper/ - 14k - [Cached](#) - [Similar pages](#)

Goooooooooooooogle ►

Result Page:    1 2 3 4 5 6 7 8 9 10    [Next](#)[Google Search](#)[Search within results](#)Dissatisfied with your search results? [Help us improve.](#)Get the [Google Toolbar](#):[Google Home](#) - [Advertise with Us](#) - [Business Solutions](#) - [Services & Tools](#) - [Jobs, Press, & Help](#)

©2003 Google

This is Google's cache of <http://www.nsi.edu/users/izhikevich/publications/patent.htm>.  
 Google's cache is the snapshot that we took of the page as we crawled the web.  
 The page may have changed since that time. Click here for the [current page](#) without highlighting.  
 To link to or bookmark this page, use the following url: <http://www.google.com/search?q=cache:otoqX0OVDxcJ:www.nsi.edu/users/izhikevich/publications/patent.htm+%2B%22rhythmic+input%22+&hl=en&ie=UTF-8>

*Google is not affiliated with the authors of this page nor responsible for its content.*

These search terms have been highlighted: **rhythmic input**

## Oscillatory Neurocomputers With Dynamic Connectivity

*Provisional Patent Application for Letters Patent of the Inited States,  
 Serial No. 60/108,353.*

Frank C. Hoppensteadt and Eugene M. Izhikevich

*Systems Science Center, Box 7606,  
 Arizona State University,  
 Tempe, AZ 85287-7606.*

**Abstract.** We suggest a novel design of neuro-computers using the following principles:

- Each neuron in the neuro-computer is a high-frequency oscillator.
- The oscillators have distinct frequencies.
- The oscillators are weakly connected by a common medium.
- The common medium is forced by an external **rhythmic input**.

When the input is constant or has inappropriate frequencies, the oscillators do not interact due to the same principle used in selective tuning in radio. However, the **rhythmic input** can force any two oscillators to interact, which we call dynamic connectivity, if the input's Power spectrum includes the frequency equal to the difference between the frequencies of the oscillators. Thus, the strength and arrangement of connections between the oscillators is not hard-wired, but it is dynamic and can be controlled by the **rhythmic input**.

There can be many realizations of such oscillatory neuro-computers since there are many mechanisms for producing these oscillatory behaviors. For example, the oscillators could be phase locked loops, VCOs (Voltage Controlled Oscillators), MEMS resonators, Josephson junctions, lasers, macromolecules, etc.

Detailed information is [available](#).

Correspondence to [Eugene Izhikevich](#)



This page has been visited 888888 times since December 21, 1998.

[\[home\]](#) [\[research\]](#) [\[publications\]](#) [\[cv\]](#) [\[album\]](#)

# Oscillatory Neurocomputers With Dynamic Connectivity

*Physical Review Letters* (1999), 82:2983-2986

Frank C. Hoppensteadt and Eugene M. Izhikevich

*Systems Science Center, Box 7606,  
Arizona State University,  
Tempe, AZ 85287-7606.*

**Abstract.** Our study of thalamo-cortical systems suggests a new architecture for a neurocomputer that consists of oscillators having different frequencies and that are connected weakly via a common medium forced by an external input. Even though such oscillators are all interconnected homogeneously, the external input imposes a dynamic connectivity. We use Kuramoto's model to illustrate the idea and to prove that such a neurocomputer has oscillatory associative properties. Then we discuss a general case. The advantage of such a neurocomputer is that it can be built using voltage controlled oscillators (VCO), optical oscillators, lasers, micro-electromechanical systems (MEMS), Josephson junctions, macromolecules, or oscillators of other kinds. .

Full text in [PDF file \(393K\)](#),

Correspondence to [Eugene Izhikevich](#)

This page has been visited  times since December 1, 1998.

[\[home\]](#) [\[research\]](#) [\[publications\]](#) [\[cv\]](#) [\[album\]](#)